von Borries, designed the first commercially available electron microscope, which went into production in 1939.

The onset of World War II cut off access of the U.S. and its allies to the Siemens microscope, but Vladimir K. Zworykin, head of electronics research at RCA, had himself already begun work on an electron microscope.[16] He brought Ladislaus Marton, a Hungarian physicist working in Belgium who had just fled the Nazis, to the Camden, NJ, laboratory in 1938. While at the Free University of Brussels, Marton had built two microscopes of his own in the early 1930s,[17] and with Zworykin he designed the RCA EM-A microscope. The EM-A had serious limitations in maintaining a vacuum, making it a poor candidate for commercial development. In early 1940, Zworykin hired James Hillier to replace Marton (who, with support from the Rockefeller Foundation, moved to Stanford to pursue technological improvements and chemical and biological applications of the electron microscope). As a graduate student of Eli F. Burton at the University of Toronto, Hillier was developing his own design for an electron microscope. At RCA, he designed what became the commercially viable RCA EM-B. Its availability was initially highly restricted during the war and only those with AA-1 priority were able to get on the waiting list to purchase one.[18]

Even during the war, opportunities emerged for biologists to use the new microscope and develop techniques appropriate for the study of cell structures. Pioneering these techniques was not for the faint-hearted. The most straightforward challenge was the need to master the numerous manual adjustments that were required to align the lenses to produce focused images. Two other challenges required considerably more effort and innovation. First, a way of preparing specimens sufficiently thin to be penetrated by the electron beam was needed. Second, specimens had to be transformed so as to survive conditions within the electron microscope and produce useful images.

[16] For details on the development of the electron microscope, see Rasmussen (1997). Rasmussen hypothesized that RCA's interest in developing an electron microscope resulted from the fact that during the war it was blocked from taking advantage of the protocols it had developed for television: "it is possible that the prestige to be won during the war for RCA's cathode-ray technique via the electron microscope may have been one reason that RCA embarked on what must at first have seemed an unremunerative program in scientific patronage" (p. 31).

[17] Marton himself pioneered in imaging biological material – in 1934 he produced and published in *Nature* the first electron micrograph of a tissue section from a plant leaf fixed with OsO_4 (Marton, 1934). Although his specimen was too thick to produce a very detailed image, Marton showed that biological material would not be destroyed by the electron beam. Nonetheless, various investigators continued to worry about that possibility in succeeding decades.

[18] The RCA EM-B and a subsequent model, the RCA EMU, which became available in 1944, were the major tools for biological electron microscopy for the subsequent ten years until the Siemens Elmiskip-1 provided an alternative.